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# A revision of the drilliid genera *Splendrillia* and *Plagiostropha* (Gastropoda: Conoidea) from New Caledonia, with additional records from other areas

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## ABSTRACT

Based on specimens from the Muséum National d'Histoire Naturelle, Paris, the drilliid genera *Splendrillia* and *Plagiostropha* from New Caledonia are revised, and information on species of these genera from other areas is included. A total of 18 species of *Splendrillia* are examined. Fourteen species are described as new: one from the Philippines and thirteen from New Caledonia (of which two are also recorded from the Mozambique Channel and one from the Philippines). *Splendrillia disjecta* (Smith, 1888) described from the Persian Gulf, is recorded from the Philippines. *Splendrillia persica* (Smith, 1888), also described from the Persian Gulf is recorded from New Caledonia. *Splendrillia solicitata* (Sowerby, 1913) described from Japan is recorded from New Caledonia. *Splendrillia praeclara* (Melvill, 1893) described from Bombay, India, is recorded from both the Philippines and New Caledonia. Four new species of *Plagiostropha* are described: three from New Caledonia and one from Réunion Island.

## RÉSUMÉ

**Révision des espèces des genres de Drilliidae *Splendrillia* et *Plagiostropha* (Gastropoda: Conoidea) de Nouvelle-Calédonie, et nouvelles signalisations d'autres régions géographiques.**

Les espèces néo-calédoniennes des genres de Drilliidae *Splendrillia* et *Plagiostropha* sont étudiées sur la base des collections du Muséum national d'Histoire naturelle. Des indications nouvelles sur les espèces de ces genres provenant d'autres régions géographiques figurent également dans ce travail. Au total, 18 espèces de *Splendrillia* sont examinées, dont 14 sont

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décrites comme nouvelles: une des Philippines et treize de Nouvelle-Calédonie (dont deux sont également connues du Canal du Mozambique et une des Philippines). *Splendrillia disjecta* (Smith, 1888), décrite du Golfe Persique, est recensée des Philippines. *Splendrillia persica* (Smith, 1888), également décrite du Golfe Persique, est signalée de Nouvelle-Calédonie. L'aire de répartition de *Splendrillia solicitata* (Sowerby, 1913), décrite du Japon, est étendue á la Nouvelle-Calédonie. Enfin, *Splendrillia praeclara* (Melvill, 1893), décrite de Bombay en Inde, est recensée des Philippines. Quatre nouvelles espéces de *Plagiostropha* sont décrites: trois de Nouvelle-Calédonie et une de la Réunion.

## INTRODUCTION

The conoidean family Turridae *sensu lato* is the largest of all of the molluscan families, with KILBURN (pers. comm.) estimating that there are over 4000 Recent species and BOUCHET (1990) showing that there have been 679 genus group names proposed; TAYLOR *et al.* (1993) recognise 337 Recent genera and subgenera as valid. Over 10,000 nominal Recent and fossil species have been described. Classification at both the species and generic levels within the Turridae has been chaotic, with little recent revisionary work having been done on this vast family. The family level classification has also been controversial, with different authors, especially POWELL (1966), MCLEAN (1971) and BOUCHET & WARÉN (1980) recognizing differing numbers of subfamilies, varying from none to 15. In the last decade some anatomical data have become available, particularly on the structure of the foregut. Recently TAYLOR *et al.* (1993) have brought together the published and previously unpublished anatomical data and have combined them with more traditional data on shell and radular structure to arrive at a tentative new classification of the Conoidea. This has involved a major modification of the concept of the family Turridae, with the family being considerably restricted and some groups being transferred to the Conidae or to other families within an expanded number of families in the Conoidea.

There has never been a complete revision of the Indo-Pacific Turridae. Over 70 years ago HEDLEY (1922) published a revision of the Australian Turridae known at that time, which included many tropical species. POWELL (1964; 1967; 1969) revised Indo-Pacific species of the subfamilies Turrinae and Turriculinae. In a major series of papers KILBURN (1983; 1985; 1986; 1988; 1991; 1992; in press) has been systematically revising the turrids of southern Africa, which include some Indo-Pacific species. KOSUGE (1983; 1985; 1986; 1988a; 1988b; 1992) examined turrids from the continental shelf and slope off northwestern Australia. WELLS (1990; 1991a; 1991b; 1993) has been revising Australian shallow water turrids.

For a number of years ORSTOM and the Muséum National d'Histoire Naturelle, Paris, have been conducting an extensive sampling programme in the Indo-Pacific, particularly in the waters surrounding New Caledonia, but also including sampling in other regions such as the Philippines. A substantial collection of turrids has been developed as a result of the field program, far too complex and large a collection to be reported in a single paper. This paper reports on the drilliid genera *Splendrillia* and *Plagiostropha*. The only substantial papers on these genera in recent decades have been KILBURN (1988) and WELLS (1990). Both genera were included in the family Drilliidae by TAYLOR *et al.* (1993).

## MATERIALS AND METHODS

As indicated above, this paper is based primarily on specimens from New Caledonia in the Muséum National d'Histoire Naturelle, Paris. Type material of related species has been borrowed wherever possible from the museum in which it was deposited. Descriptions are based on shells oriented in the traditional way, spire up with the aperture facing the viewer.

## ABBREVIATIONS AND TEXT CONVENTIONS

*Repositories*

AMS : Australian Museum, Sydney
BMNH : The Natural History Museum, London
MNHN : Muséum National d'Histoire Naturelle, Paris
NMW : National Museum of Wales, Cardiff
WAM : Western Australian Museum, Perth

*Other abbreviations*

L : length
W : width
A : length of aperture
lv : live taken specimen
dd : dead collected specimen
OD : Original designation.

## SYSTEMATIC ACCOUNT

### Family DRILLIIDAE Olsson, 1964

### Genus *SPLENDRILLIA* Hedley, 1922

*Splendrillia* Hedley, 1922: 250. Type species (OD): *Drillia woodsi* Beddome, 1883.

*Splendrillia* – POWELL, 1942: 99-104. — COTTON, 1947: 11. — LASERON, 1954: 16-17. — POWELL, 1966: 83-84; 1979: 232-234. — KILBURN, 1988: 206-218. — SYSOEV & KANTOR, 1989: 205-214. — WELLS, 1990: 76-100; 1991b: 63-68. — TREW, 1991: 8-9. – TAYLOR *et al.*, 1993: 164.
*Elaeocyma* (*Splendrillia*) – TSUCHIDA, 1983: 344-346.

DIAGNOSIS. — *Shells* small to medium, 5-30 mm, light to solid, high spired, truncated anterior end. *Protoconch* paucispiral. 2 whorls, usually smooth, rounded to globose. Up to 9 *teleoconch* whorls usually with strong axial ribs, spiral sculpturing absent or restricted to anterior of shell. Pronounced parietal callus in many species. Sinus moderate to deep, outer lip thin to thickened, slight stromboid notch on base of outer lip. Anterior canal short, broad, shallow to strongly notched. Shell white to brown. Operculum oblolanceate, nucleus terminal.

Indo-Pacific and southern Australia; intertidal to ca. 1000 m.

REMARKS. — Both the genera *Splendrillia* and *Plagiostropha* have been recently included in the turrid subfamily Drilliinae (KILBURN 1988; WELLS 1990), but TAYLOR *et al.* (1993) have recently raised the Drilliinae to family level, based largely on anatomical grounds.

As presently construed the genus *Splendrillia* is composed of species grouped together almost entirely on knowledge of their shell features. Aside from the single study of SYSOEV & KANTOR (1989) there have been no examinations of the anatomy of any of the species, and even the structure of the radula and opercula are not known for most species. The genus *Splendrillia* has never been revised in the Indo-West Pacific, though POWELL (1966) included several species in the genus which had previously been placed in *Drillia*. In view of the problems in properly defining the genus it is likely that when, and indeed if, the anatomy becomes known many of the species now considered to belong to *Splendrillia* will be transferred to other genera, perhaps including new genera. With the several

hundred generic names available in the Turridae (BOUCHET 1990) it seems preferable to adopt a broad view of the genus *Splendrillia* rather than erect new genera which might later turn out to be synonyms of genera already proposed.

### *Splendrillia disjecta* (Smith, 1888)

Pl. 1, Figs 1-2; Pl. 2, Figs 1-2

*Pleurotoma (Drillia) disjecta* Smith, 1888: 308.

Other references:

*Drillia disjecta* – DAUTZENBERG & BOUGE, 1913: 132.
*Splendrillia disjecta* – POWELL, 1966: 84.

TYPE MATERIAL. — 4 syntypes BMNH 1874.1.19.31.

TYPE LOCALITY. — "Persian Gulf, China Sea, and Ovalau, Fiji".

MATERIAL EXAMINED. — The type material.
**Philippines**. MUSORSTOM 2: stn CP 41, 13°46′ N, 122°46′ E, 166-172 m, 4 lv, 2 dd.

DISTRIBUTION. — Persian Gulf to the Philippines. To at least 166 m.

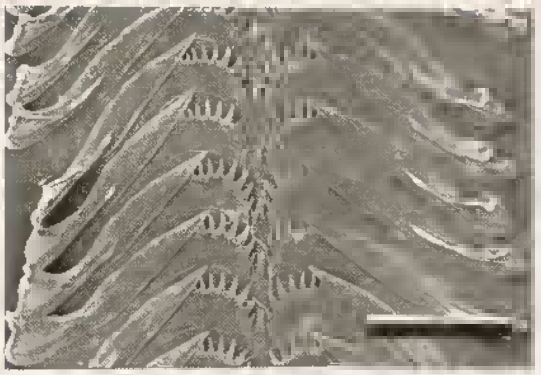
DESCRIPTION. — *Shell* small, 8 mm, high spired, solid. *Protoconch* small, of 2 smooth whorls with microscopic pitting, globose, 0.56 mm wide, 0.45 mm high. *Teleoconch* up to 7 turreted whorls with two prominent convexities in outline. Suture distinct, slightly channeled, nearly straight. Dominant sculpture of axial ribs, which line up on upper whorls. Ribs vertical, narrow, starting as prominent subsutural beads, decreasing, then swelling again at midwhorl, decreasing only slightly to lower whorl, 8 on penultimate whorl, 6-7 on body whorl followed by moderately strong varix, ribs extending well beyond shoulder of body whorl. About 7 distinct spiral cords just above anterior tip of shell. Strong axial growth lines present on body whorl. Outer lip thickened. Sinus very deep, U shaped, directed at a 45° angle to shell axis, posterior margin callused, entrance partially constricted by very strong parietal callus. Aperture moderately broad, subrectangular. Columella narrow, straight, margin distinctly raised. Shell truncate, anterior canal short, broad, deep, anterior tip notched. Shell colour uniform glossy white.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| BMNH syntypes | 7.1 | 2.4 | 2.9 | 0.34 | 0.41 |
| | 7.1 | 2.3 | 2.7 | 0.32 | 0.38 |
| | 7.6 | 2.4 | 2.7 | 0.32 | 0.36 |

REMARKS. — *Splendrillia disjecta* is a distinctive species with narrow axial ribs lined up on adjacent whorls. The ribs each have two peaks, one subsutural and a second, larger peak on the lower half of each whorl. The Philippines material is identical to the types in having the same protoconch size and same number of whorls, but the ribs are slightly larger and more rounded. The Philippines shells are more colourful because they were collected alive or soon after death.

*Splendrillia disjecta* is similar to *S. persica*. The Philippines material of *S. disjecta* consists of fresh shells with plenty of colour which do not at first glance look the same as those of *S. persica*, but the shells are similar in size and number of whorls, and the protoconchs are of the same size. The whorls of *S. persica* are slightly broader than those of *S. disjecta*, and the ribs are also slightly broader, they extend down the face of the body whorl, and the protoconch is of the same size. The absence of a parietal callus is a key difference separating *S. disjecta* from *S. persica*.



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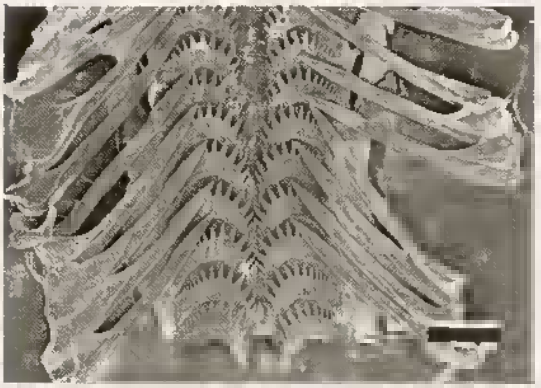

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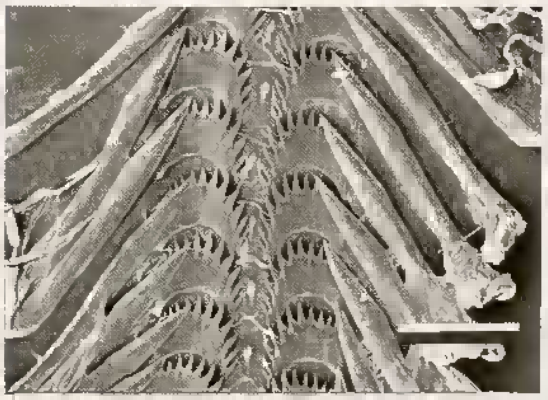

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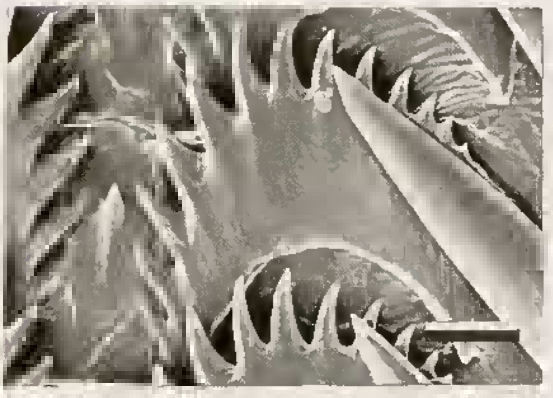

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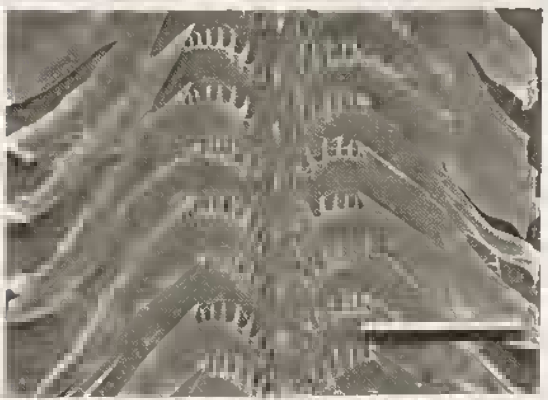

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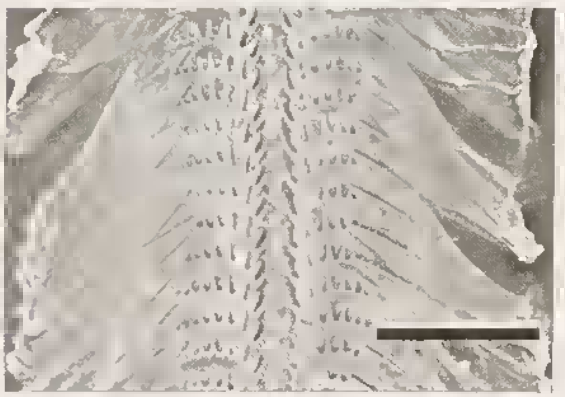

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PLATE I. Radulae of *Splendrillia*. — 1-2, *S. disjecta*, Philippines, MUSORSTOM 2: stn CP 41. — 3-4, *S. solicitata*, Loyalty Islands, MUSORSTOM 6: stn DW 468. — 5-6, *S. elongata*, Philippines, MUSORSTOM 3: stn CP 106. — 7, *S. carolae*, New Caledonia, BIOCAL: stn DW 46. — 8, *S. triconica*, New Caledonia, BIOCAL: stn DW 44. Scale lines: 100 µm (1, 3, 5, 7-8), 20 µm (2, 4, 6).

## *Splendrillia persica* (Smith, 1888)

Pl. 2, Figs 3-4

*Pleurotoma persica* Smith, 1888: 307.
*Drillia persica* var. *jacintha* Melvill, 1917: 156, pl. 9, fig 6.

Other references:

*Pleurotoma persica* – Melvill & Standen, 1901: 429, pl. 21, fig 14.
*Splendrillia persica* – Powell 1966: 84. — Trew, 1991: 9. — Wells, 1993: 114-116, pl. 1, figs 3-4.
*Splendrillia persica* var. *jacintha* – Trew, 1991: 9.

Type material. — *P. persica*: 4 syntypes BMNH 1874.1.19.30. — *D. persica* var. *jacintha*: 2 syntypes BMNH 1925.3.12.2.3; 2 syntypes NMW 1955.158.478.

Type locality. — *P. persica*: Persian Gulf; var. *jacintha*: Persian Gulf [defined by Melvill as including the Gulf of Oman, "bordered eastward by long. 59°48′ E"].

Material examined. — The type material.

**NW Indian Ocean**. Persian Gulf (4 NMW). — Linyah, Persian Gulf (AMS). — Gulf of Oman, 24°58′ N, 56°54′ E, 285 m (NMW). — Charbar, Gulf of Oman, 73 m (AMS). — Henjam I., Iran (3 NMW). — Karachi, Pakistan (AMS). — Bahrain (AMS).

**New Caledonia**. LAGON: stn 830, Poindimié area, 20°49′ S, 165°19′ E, 105-110 m, 5 dd (MNHN).

Distribution. — Indo-West Pacific; Persian Gulf to New Caledonia in depths of from 73 to 285 m.

Description. — *Shell* medium, to 14 mm, very high spired. *Protoconch* small, of 2 whorls, rounded, slightly globose with very fine microscopic pitting, lower part of whorl with indistinct spiral rib giving outline a triangular appearance, 0.66 mm wide, 0.51 mm high. *Teleoconch* of up to 7 angular whorls, turreted. Suture distinct, slightly impressed, slightly undulating. Sculpture dominated by strong, narrow axial ribs, which form 1/3 way down whorl, reach maximum by midwhorl, continue to lower suture, tending to line up on adjacent whorls, 8-11 on penultimate whorl, 8-11 on body whorl, extend below shoulder of body whorl but not to anterior tip of shell, distinct varix usually present on body whorl, if so remainder of whorl is smooth. Spiral sculpture absent except for a series of about five indistinct striae near anterior tip of shell. Axial growth lines present. Outer lip slightly thickened with faint stromboid notch on lower surface. Sinus on mid-shoulder, very deep, U-shaped, margin thickened. Parietal callus strong. Aperture subrectangular, deep. Columella narrow, callused margin. Shell truncate, anterior canal short, broad, deep, anterior tip distinctly notched. Entire shell off-white glossy, some specimens with a yellowish tinge between the axial ribs.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| *persica* | | | | | |
| BMNH syntypes | 8.9 | 2.9 | 3.3 | 0.33 | 0.37 |
| 1874.1.19.30 | 8.4 | 2.9 | 3.2 | 0.35 | 0.38 |
| | 8.6 | 3.0 | 3.3 | 0.35 | 0.41 |
| | 7.0 | 2.3 | 2.9 | 0.33 | 0.41 |
| *persica* var. *jacintha* | | | | | |
| BMNH syntypes | 13.7 | 4.5 | 4.6 | 0.33 | 0.34 |
| 1925.3.12.2.3 | 11.7 | 3.7 | 3.7 | 0.32 | 0.32 |
| NMW syntypes | 8.7 | 2.8 | 2.8 | 0.32 | 0.32 |
| 1955.158.478 | 9.4 | 3.9 | 2.9 | 0.42 | 0.31 |

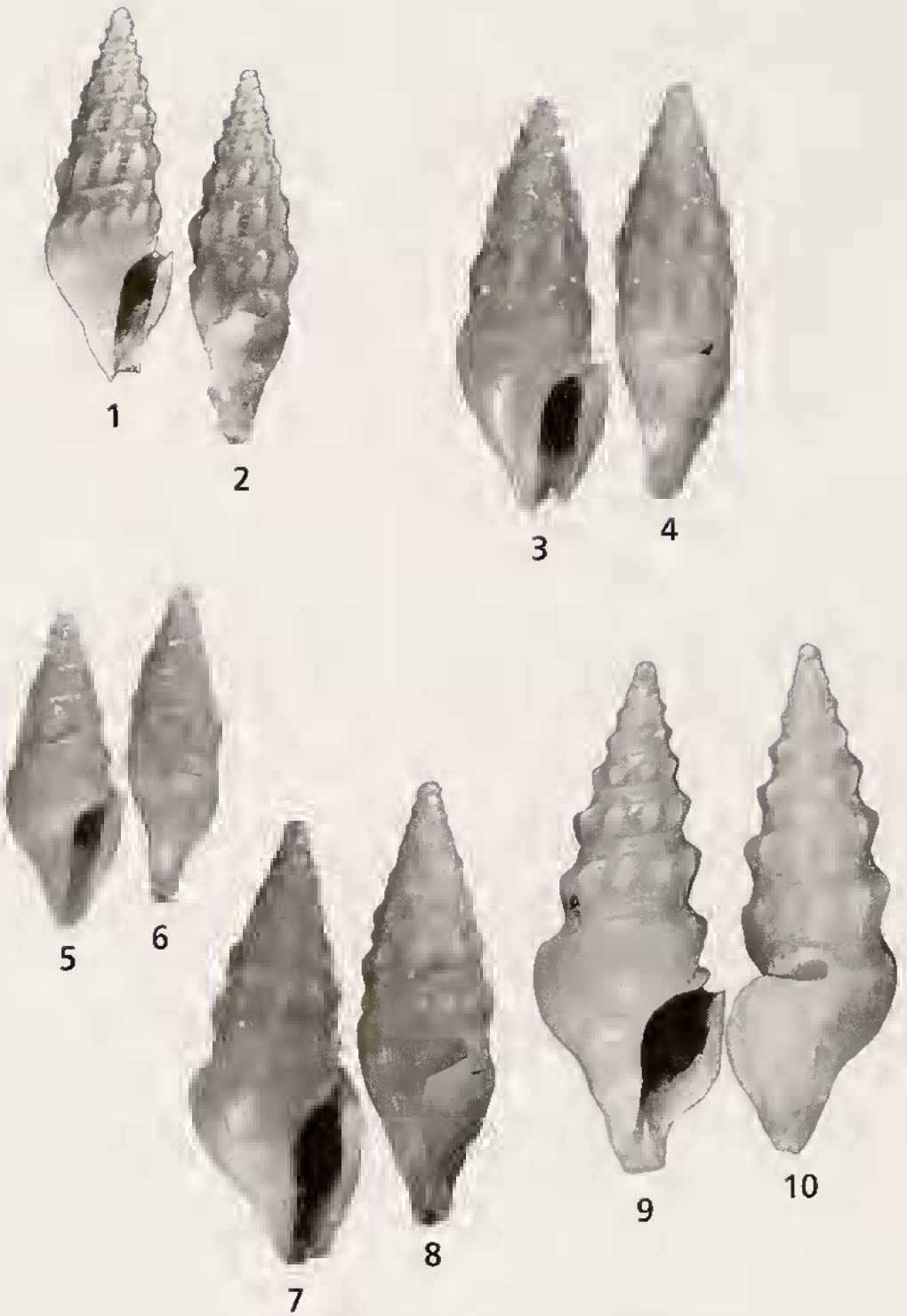


PLATE 2. — *Splendrillia*. — 1-2, *S. disjecta*. New Caledonia, LAGON: stn 830. — **3-4**, *S. persica* . New Caledonia. LAGON: stn 830. — **5-6**, *S. intermedia* sp. nov. Holotype. — **7-8**, *S. striata* sp. nov. Holotype. — **9-10**, *S. solicitata*. New Caledonia. MUSORSTOM 4: stn DW 222.

REMARKS. — The syntypes of *Drillia persica* var. *jacintha* are similar to those of *Pleurotoma persica*, but are larger (12-14 mm vs. 7-9 mm), with essentially the same number of axial ribs, 8-9 on the penultimate whorl and 7-8 on the body whorl, compared to 8-11 on both whorls of *S. persica*, and the ribs extend further down the body whorl. The basic distinction is the greater shell length of *jacintha*, and subspecific separation is not warranted.

The New Caledonian specimens are very similar, slightly smaller, with the same size protoconch, the callus and ribs are similar, but the material differs slightly in that the front face of the body whorl is smooth and slightly more pustulose just below the suture.

As discussed above, *S. persica* is similar to *S. disjecta* in shell shape: they are of the same size, have the same number of whorls, and the protoconchs are of the same size, but *S. persica* is slightly narrower, with slightly narrower ribs which do not extend as far on the face of the body whorl. A parietal callus is present on *S. persica* but not on *S. disjecta*.

### ***Splendrillia intermedia*** sp. nov.

Pl. 2, Figs 5-6

TYPE MATERIAL. — Holotype MNHN. Paratype WAM 16-94.

TYPE LOCALITY. — West Indian Ocean. Mozambique Channel, BENTHEDI, stn DR 08, 11°29′ S, 47°18′ E, 250 m.

MATERIAL EXAMINED. — **West Indian Ocean.** Mozambique Channel. BENTHEDI: stn DR 08, 11°29′ S, 47°18′ E, 250 m, 1 lv (holotype). — Stn DR 33, 12°54′ S, 45°16′ E, 275-400 m, 1 dd (paratype).
**Loyalty Islands**. MUSORSTOM 6: stn DW 440, 20°49′ S, 167°17′ E, 288 m, 1 dd (MNHN).

DISTRIBUTION. — Mozambique Channel and New Caledonian region in depths of from 250 to at least 288 m.

DESCRIPTION. — *Shell* medium, 12 mm, high spired. *Protoconch* small, smooth with very fine microscopic pitting, rounded, of 2 whorls, 0.45-0.60 mm high, 0.70-0.75 mm wide. *Teleoconch* of 7 convex whorls. Suture thin, distinct, undulating. Sculpture dominated by strong, rounded axial ribs, of moderate width, beginning at upper suture, increasing gradually, reaching maximum below midwhorl, decreasing but still strong at lower suture, tending to match up on several adjacent whorls but not for entire spire, 8 on penultimate whorl. Two strong ribs at beginning of body whorl but remainder of face of body whorl smooth, left side swollen by strong rib. About 10 faint spiral striae near anterior tip of shell. Shell surface smooth except for faint axial growth lines. Outer lip slightly thickened, slightly incurved with distinct stromboid notch near base. Sinus subsutural, deep, 45° angle to shell axis, margins thin but distinctly raised, entrance nearly sealed by strong subsutural parietal callus. Aperture almost semicircular, outer edge straight but columellar margin distinctly rounded. Columella narrow, nearly straight, margin slightly callused. Anterior canal short, broad, shallow, anterior tip strongly notched. Shell colour glossy white with yellow patches between ribs of lower spire whorls.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 11.1 | 4.6 | 4.8 | 0.41 | 0.43 |
| Paratype | 11.8 | 4.6 | 4.4 | 0.39 | 0.37 |
| MUSORSTOM 6 stn DW 440 | 7.5 | 2.9 | 3.4 | 0.39 | 0.45 |

REMARKS. — With its broad shape, low spire and angular whorls, *Splendrillia intermedia* is a distinctive species. It resembles a species of *Plagiostropha* with its 8 distinct ribs on the upper whorls, giving the shell an octagonal appearance in transverse section. However, *S. intermedia* can be

separated from all *Plagiostropha* by the 8 ribs as opposed to the five normal for *Plagiostropha*. In addition the ribs are not as strong and are not continuous to the body whorl.

ETYMOLOGY. — *Intermedia* refers to the shape of this species, which is somewhat intermediate between that of most *Splendrillia* and the genus *Plagiostropha*.

***Splendrillia striata*** sp. nov.

Pl. 2, Figs 7-8

TYPE MATERIAL. — Holotype lv and 5 paratypes dd MNHN.

TYPE LOCALITY. — New Caledonia, MUSORSTOM 4, stn DW 156, 18°54' S, 163°19' E, 525 m.

MATERIAL EXAMINED. — Only known from the type material.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION. *Shell* medium size for genus, 14 mm, high spired, solid. *Protoconch* large, high, top rounded, smooth, of 2 whorls, 1.00 mm high, 1.05 mm wide. *Teleoconch* of 8 irregularly shaped whorls. Suture distinct, nearly straight, slightly adpressed. Upper whorls with subsutural spiral cord, entire surface with fine but distinct spiral striae, less visible on body whorl, anterior tip of shell with about 20 more distinct striae. Dominant sculpture is moderately strong axial ribs, which form about 1/3 down whorl, enlarging by midwhorl, decreasing only slightly to lower suture. Combination of ribs and spiral cord gives whorl outline a slight swelling on top, decreasing below cord, then ribs swell to a larger size below the spiral cord. Ribs broad, reaching low peaks, 10 on penultimate whorl, do not line up on adjacent whorls. Eight smaller ribs at beginning and front face of body whorl, final rib on left face swollen into varix, no ribs on back of body whorl, except one small rib on outer lip. Outer lip thickened, broken on holotype, but paratype has a strongly incurved lip, broad stromboid notch on lower part. Sinus just subsutural, very deep, at a 30° angle to shell axis, entrance nearly sealed by incurved outer lip and strong subsutural parietal callus. Aperture broad, subrectangular, deep. Columella narrow, slightly swollen in center, margin callused. Anterior canal short, very broad, of moderate depth. Anterior tip slightly notched. Shell colour uniform semiglossy off-white in holotype, paratypes very light brown.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 14.5 | 6.0 | 6.0 | 0.41 | 0.41 |
| Paratypes | 14.3 | 5.8 | 6.1 | 0.41 | 0.43 |
| | 14.1 | 5.6 | 5.6 | 0.40 | 0.40 |
| | 10.0 | 4.4 | 4.4 | 0.44 | 0.44 |

REMARKS. — *Splendrillia striata* differs from most other species of *Splendrillia* in having fine spiral striae over most of the shell surface except the body whorl. Some other species have spiral striae but they are not as distinct as in *S. striata*. *Spleudrillia striata* is most similar to *S. solicitata*, but can be distinguished by being smaller (14 mm vs. 18 mm), in having fine spiral cords which are lacking on *S. solicitata*, and in its yellowish colour.

ETYMOLOGY. — *Striata* refers to the fine spiral striae on shells of this species.

## *Splendrillia solicitata* (Sowerby, 1913)

Pl. 1, Figs 3-4; Pl. 2, Figs 9-10

*Drillia solicitata* Sowerby, 1913: 234, pl. 3, fig. 2.

Other reference:
*Splendrillia solicitata* — Powell, 1966: 84.

Type material. — Holotype BMNH 1914.1.7.275.

Type locality. — Goto, Japan.

Material examined. — The type material.
**New Caledonia.** MUSORSTOM 4: stn DW 222, 22°58′ S, 167°33′ E, 410-440 m, 1 dd (WAM 19-94). — Stn DW 226, 22°47′ S, 167°22′ E, 390 m, 1 lv, 1 dd (MNHN).
SMIB 2: stn DW 9, 22°54′ S, 167°15′ E, 475-500 m, 1 dd (MNHN).
SMIB 3: stn DW 29, 22°47′ S, 167°12′ E, 405 m, 1 dd (MNHN).
**Loyalty Islands.** MUSORSTOM 6: stn DW 468, 21°06′ S, 167°33′ E, 600 m, 1 lv (MNHN).

Distribution. — Japan and New Caledonia, in depths of from 390 to 600 m.

Description. — *Shell* medium, 14 mm, high spired, heavy. Upper whorl(s) and protoconch of holotype broken off. Seven remaining, slightly turreted teleoconch whorls. *Protoconch* of New Caledonian material high, rounded, smooth with microscopic pitting, of 2.5 whorls, 0.70 mm high, 1.00 mm wide. *Teleoconch* of 7 angular whorls. Suture distinct, slightly adpressed, nearly straight. Upper surface of whorls smooth, nearly flat, with slight, narrow, subsutural spiral cord. Axial ribs are dominant sculpture, beginning nearly halfway down whorl with distinct increase along top of ribs. Ribs of moderate width, low, rapidly swelling to maximum size, decreasing towards, but reaching lower suture, base angled to left, not lined up on adjacent whorls, 10-11 on penultimate whorl, 7 on first half of body whorl, outer half of body whorl without ribs, no varix, ribs not extending beyond shoulder. Very faint series of 10-15 spiral cords across base of body whorl. Axial growth lines numerous, distinct in places. Outer lip thick, margin smooth. Sinus very deep, U shaped, on mid-shoulder, opening constricted by heavy callus, 60° angle to shell axis. Aperture narrow, elongate oval, deep. Columella broad, slightly convex, margin raised. Shell truncate, anterior canal short, broad, deep, anterior lip distinctly notched. Shell glossy off-white with light yellowish bands above and below ribs and across middle of body whorl.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 14.1 | 5.5 | 5.2 | 0.39 | 0.37 |
| New Caledonia | 18.0 | 6.8 | 7.9 | 0.38 | 0.44 |
| | 14.8 | 5.3 | 5.3 | 0.36 | 0.36 |

Remarks. — The New Caledonian material is identical to the type of *Splendrillia solicitata* except that the ribs do not extend onto the face of the body whorl, and on the penultimate whorl they are not as pronounced. The ribs stop after the face of the body whorl on the holotype of *S. solicitata*. The New Caledonian specimens are variable in this regard.

*Splendrillia solicitata* is closest to *S. parciplicata* (Sowerby, 1915), which is of similar size and comes from the same geographic area. It may be separated from *S. parciplicata* by its broader shape and differences in the axial rib structure. The ribs of *S. parciplicata* begin higher up on the whorl, are narrower and more numerous (16 on the penultimate whorl versus 10), and extend over the entire body whorl. Another Japanese species, *S. raricostata* (Smith, 1879), is smaller (11 vs. 14 mm), narrower, has stronger axial ribs, a varix on the body whorl, and pronounced spiral cords across the base of the body whorl.


PLATE 3. — Opercula of *Splendrillia*. **1-2**, *S. houbricki*, inner and outer views, New Caledonia, BIOCAL: stn DW 66, 1.3 and 1.5 mm. — **3**, *S. elongata*, Philippines, MUSORSTOM 3, stn CP 106, 2.5 mm. — **4**, *S. triconica*, New Caledonia, BIOCAL: stn DW 44, 1.5 mm.

*Splendrillia solicitata* is also similar to *S. brycei*, but lacks the fine spiral striae of *S. brycei*, is larger (up to 18 mm vs. 14 mm), the axial ribs are angled to the right instead of straight and are larger and more angular.

*Splendrillia solicitata* is similar to a specimen labeled as *Splendrillia resplendens* (Melvill, 1898) from Karachi in the NMW. It differs in being longer, in having the ribs starting lower on the whorl, in having the left side of the body whorl more swollen, and in having the front face of the body whorl smooth, and lacking ribs.

### *Splendrillia taylori* sp. nov.

Pl. 4, Figs 1-2

TYPE MATERIAL. — Holotype dd MNHN.

TYPE LOCALITY. — New Caledonia, MUSORSTOM 4, stn DW 186, 19°07′ S, 163°30′ E, 190 m.

MATERIAL EXAMINED. — Only known from the type material.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION. — *Shell* medium, 15 mm, high spired, solid. *Protoconch* small, high, conical, smooth with fine microscopic pitting, of 2 whorls, 0.70 mm wide, 0.55 mm high. *Teleoconch* of 9 angular whorls. Suture narrow, indistinct, undulating. Very thin, distinct subsutural, spiral cords, up to 10 on whorl, extending onto upper surface of ribs. Sculpture dominated by strong, but narrow and low axial ribs, 8 on penultimate whorl, beginning almost halfway down whorl, reaching rapid peak and declining but reaching lower suture, ribs slightly curved, angled to left, tending to match up on adjacent whorls. Ribs on shoulder of body whorl small, indistinct, 10 in number but an additional rib may have been obscured by a shell repair, final rib swollen into varix. About 7 distinct spiral cords near anterior tip of shell, with several fainter cords above. Faint axial growth lines present on all whorls. Outer lip thickened, strongly incurved, strong stromboid notch on lower portion. Sinus subsutural, deep, at 45° angle to shell axis, margins raised. Aperture deep, moderate width, elongate-ovate. Columella of moderate width, slightly convex, margin strongly callused. Anterior canal short, broad, deep, anterior tip strongly notched. Shell colour glossy off-white, outer lip tinged with yellowish-brown.

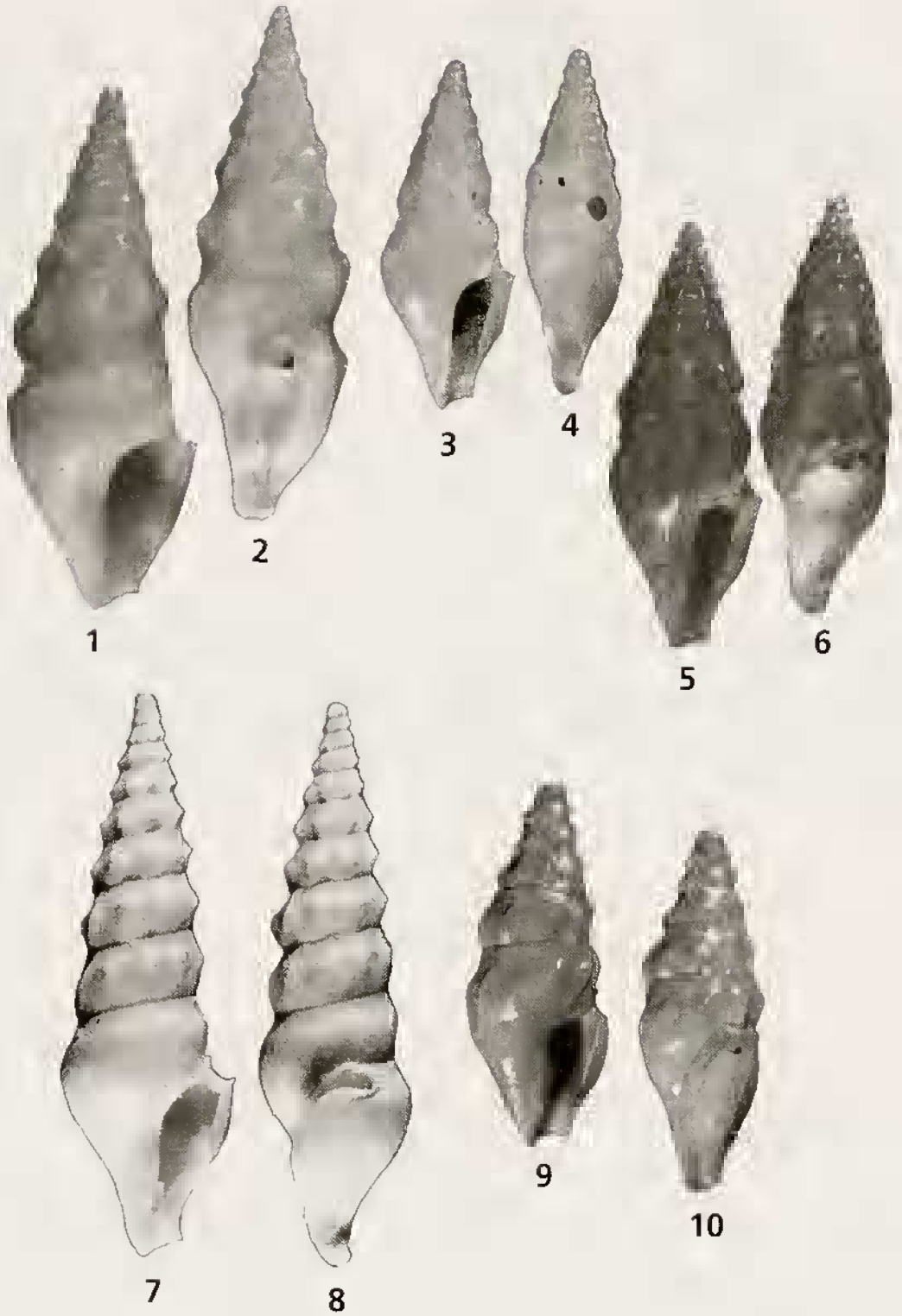


PLATE 4. — *Splendrillia*. — **1-2**, *S. taylori* sp. nov. Holotype. **3- 4**, *S. boucheti* sp. nov. Holotype. — **5-6**, *S. praeclara*, Philippines, MUSORSTOM 3; stn CP 87. — **7-8**, *S. elongata* sp. nov. Holotype. **9-10**, *S. minima* sp. nov. Holotype.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 15.1 | 5.5 | 5.5 | 0.36 | 0.36 |

REMARKS. — *Splendrillia taylori* is closest to *S. striata* in having the same general shape and size and especially the presence of fine spiral striae. It can be separated by its narrower shell, with a strong varix on the outer lip instead of on the left face of the body whorl as in *S. striata*. The ribs of *S. taylori* are narrower than on *S. striata* and the beginning of the upper surface of the ribs is less distinct.

ETYMOLOGY. — This species is named after Dr John TAYLOR of the Natural History Museum, London in recognition of the considerable importance his work has had in improving our knowledge of the systematics of turrids.

***Splendrillia boucheti*** sp. nov.

Pl. 4, Figs 3-4

TYPE MATERIAL. — Holotype dd MNHN.

TYPE LOCALITY. — Loyalty Islands, MUSORSTOM 6, stn DW 439, 20°46′ S, 167°17′ E, 288 m.

MATERIAL EXAMINED. — Only known from the type material.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION. — *Shell* small, 8 mm, biconic, very high spired. *Protoconch* small, high, smooth, of 2 whorls, 0.60 mm high, 0.70 mm wide. *Teleoconch* of 6 convex whorls. Suture strong, straight, channeled. Sculpture dominated by 7 strong axial ribs per whorl, lined up on adjacent whorls to give shell heptagonal shape. Subsutural spiral cord becomes progressively less distinct on lower whorls, nodulose on upper part of rib, continuous with rib from preceding whorl. Rib decreases below cord, then expands at middle of whorl. Ribs broad at base but narrow rapidly to form narrow top. First and second ribs of body whorl progressively smaller and less distinct, third rib swollen on left side of front of body whorl, back of body whorl lacking ribs. Numerous axial growth lines present, but very faint. Outer lip slightly thickened, small narrow axial rib on outer surface, lip incurved, no stromboid notch on lower edge. Sinus on outer shoulder, well down from suture, broad, deep, U-shaped, margins raised, at 30° angle to shell axis. Strong parietal callus present, but not blocking entrance to sinus. Aperture broad, deep, subrectangular, lower end not narrowed. Columella very narrow, slightly convex, margin strongly callused. Anterior canal short, broad, deep, anterior tip of shell notched. Shell colour glossy white with slight yellowish tinting between some of the ribs.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 7.9 | 3.1 | 3.5 | 0.39 | 0.44 |

REMARKS. — As with *Splendrillia intermedia*, *S. boucheti* has a resemblance to species of the genus *Plagiostropha*. It differs in being heptagonal and in having ribs which are not as strong as in *Plagiostropha*.

ETYMOLOGY. — I am pleased to name this species after Dr Philippe BOUCHET of the MNHN in recognition of his substantial contributions to malacology and his generosity in making the material used for this paper available to me.

### *Splendrillia praeclara* (Melvill, 1893)

Pl. 4, Figs 5-6

*Drillia praeclara* Melvill, 1893: 1, pl. 1.

Other reference:
*Drillia praeclara* – Melvill, 1917: 161.

Type material. — Holotype BMNH 1893.2.16.11, 2 paratypes 1955.158.494 NMW (*fide* Trew).

Type locality. — Bombay, India.

Material examined. — The type material.
**Philippines**. MUSORSTOM 1: stn DR 14, 14°00′ N, 120°17′ E, 190 m, 1 lv (MNHN). — Stn DR 15, 14°00′ N, 120°18′ E, 188-192 m, 1 dd (MNHN).
MUSORSTOM 3: stn CP 87, 14°00′ N, 120°19′ E, 191-197 m, 1 dd (MNHN). — Stn CP 143, 11°29′ N, 124°11′ E, 205-214 m, 1 dd (MNHN).
**New Caledonia**. LAGON: stn 80, 22°31′ S, 166°28′ E, 33 m, 1 dd (MNHN).

Distribution. — India and the Philippines in depths from 190 to 214 m.

Description. — *Shell* small, 8 mm, high spired. *Protoconch* small, rounded, of 2 whorls, second whorl has faintly developed axial ribs, 0.75 mm high, 0.75 mm wide. *Teleoconch* of 6 convex whorls. Suture distinct, slightly impressed, strongly undulating. Single strong, undulating subsutural spiral cord. Dominant sculpture of strong, broad axial ribs which begin at base of spiral cord, are smooth surfaced, broadest at midrib, extend to lower suture where they are still strong, do not line up on adjacent whorls, 7 ribs on penultimate whorl, 4 on body whorl followed by strong varix, last half of body whorl nearly smooth with several indistinct ribs. 7 distinct spiral cords just above anterior tip of shell. Faint growth lines present. Outer lip thickened, incurved, faint stromboid notch on lower edge. Sinus very deep, at 45° angle to shell axis, U-shaped, margin partially closed by strong callus. Aperture narrow, subrectangular, deep. Columella narrow, slightly convex, margin distinct. Shell truncate, anterior canal short, very broad, deep, anterior tip strongly notched. Shell colour glossy light pink.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 7.9 | 3.2 | 3.2 | 0.41 | 0.41 |

Remarks. — *Splendrillia praeclara* is most similar in size and shape to *S. jarosae* Wells, 1991 from northern Australia, but differs in having fewer (7 vs. 16 on penultimate whorl), but stronger axial ribs, and a stronger, undulating spiral cord. *Splendrillia praeclara* may also be compared to *S. persica* and *S. raricostata* (Smith, 1879) but differs by its broader shell with broader axial ribs, and in having a strong subsutural spiral cord.

A shell from New Caledonia [LAGON: stn 80, 22°31′ S, 166°28′ E, 33 m (MNHN)] differs from the material from the Philippines by having a multispiral protoconch.

### *Splendrillia elongata* sp. nov.

Pl. 1, Figs 5-6; Pl. 3, Fig. 3; Pl. 4, Figs 7-8

Type material. — Holotype MNHN. Paratypes: 12 MNHN, 1 WAM 18-94.

Type locality. — Chesterfield Islands. MUSORSTOM 5, stn 322, 21°19′ S, 158°00′ E, 975 m.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3: stn CP 106, 13°47′ N, 120°30′ E, 640-668 m, 8 lv, 14 dd.
**Chesterfield Islands**. MUSORSTOM 5: stn 321, 21°20′ S, 158°02′ E, 1000 m, 1 lv (paratype). — Stn 322, 21°19′ S, 158°00′ E, 975 m, 5 dd (holotype and paratypes). — Stn 326, 21°07′ S, 157°47′ E, 980 m, 1 dd (paratype WAM 18-94). — Stn 357, 19°37′ S, 158°46′ E, 630 m, 1 dd (paratype). — Stn 390, 21°01′ S, 160°50′ E, 745-825 m, 1 dd (paratype).
**New Caledonia**. *"Vauban"* 1978-79: stn 32, 22°32′ S, 166°25′ E, 430-500 m, 1 dd (paratype).
BIOGEOCAL: stn CP 232, 21°34′ S, 166°27′ E, 760-790 m, 2 dd (paratypes). — Stn DW 291, 20°34′ S, 166°54′ E, 510-520 m, 1 dd (paratype). — Stn DW 311, 20°49′ S, 166°54′ E, 1620 m, 1 dd (paratype).

DISTRIBUTION. — Philippines to New Caledonia and Chesterfield Islands in depths of from 430 to 1620 m.

DESCRIPTION. — *Shell* large, 17 mm, very high spired, narrow. *Protoconch* small, high, dome-shaped, smooth with very fine microscopic pitting, of 2 whorls, light orange colour, 0.69 mm high, 0.78 mm wide. *Teleoconch* up to 10 whorls, triangular in outline. Suture thin, nearly straight, slightly channeled. Dominant sculpture of strong axial ribs, which form just below suture but are indistinct, rise to sudden peak in centre, just below midwhorl, decrease but reach lower suture, and are of nodulose shape, ribs absent on body whorl, 11 on penultimate whorl but first few are very faint and become stronger going up the spire, ribs do not match up on adjacent whorls. Slight spiral striae on shoulder just above nodulose part of rib. Very faint spiral striae on whorl surface, last 6 near anterior lip of body whorl are stronger. Axial growth lines faint. Outer lip slightly thickened, slightly incurved, distinct stromboid notch on lower edge. Sinus subsutural, broad, deep, U-shaped, margins slightly raised and thickened. Small subsutural callus which does not block entrance to sinus. Aperture of moderate width, elongate-ovate, deep. Columella thin, smooth, nearly straight, margin slightly callused. Anterior canal moderately long, of moderate width, slightly curved to right at base. Shell colour uniform glossy white except for light orange protoconch.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 17.1 | 5.2 | 5.8 | 0.30 | 0.34 |
| Paratypes stn 322 ($n=4$) | | | | | |
| Range | 14.3-16.7 | 4.1-5.2 | 4.1-5.8 | 0.29-0.31 | 0.29-0.35 |
| Mean | 15.5 | 5.0 | 5.1 | 0.32 | 0.33 |
| SD | 1.0 | 0.6 | 0.6 | 0.02 | 0.03 |

REMARKS. — The very high spire of *Splendrillia elongata* is the key feature of this species, and distinguishes it from all of the other *Splendrillia* collected in the New Caledonia sampling program. *Splendrillia elongata* is closest to two southern Australian species, *S. lygadina* (Hedley, 1922) and *S. acostata* (Verco, 1909). Both Australian species are somewhat larger, *S. lygadina* reaching 24 mm and *S. acostata* 21 mm, compared to 17 mm for *S. elongata*. *Splendrillia elongata* is intermediate in sculpture between the smooth *S. acostata* which lacks axial ribbing and the very heavily ribbed *S. lygadina*.

There is an unidentified turrid species in the New Caledonian material which is very similar to *Splendrillia elongata*. The two can be easily separated by the number of whorls of the protoconch: 2 whorls in *S. elongata* and 4 high whorls in the unidentified species.

ETYMOLOGY. — *Elongata* refers to the very high spire of this species.

***Splendrillia minima*** sp. nov.

Pl. 4, Figs 9-10

TYPE MATERIAL. — Holotype MNHN. Paratypes: 4 MNHN, 1 WAM 21-94.

TYPE LOCALITY. — Philippines, MUSORSTOM 3, stn DR 94, 13°47′ N, 120°03′ E, 842 m.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3: stn DR 94, 13°47′ N, 120°03′ E, 842 m, 1 dd (holotype). — Stn CP 139, 11°53′ N, 122°14′ E, 240-267 m, 1 dd (paratype WAM 21-94). — Stn CP 143, 11°29′ N, 124°11′ E, 205-214 m, 4 dd (paratypes).

DISTRIBUTION. — The Philippines in depths of from 205 to 842 m.

DESCRIPTION. — *Shell* very small, 6 mm, high spired, solid. *Protoconch* small, dome shaped, smooth, of 1 whorl, 0.55 mm wide, 0.30 mm high. *Teleoconch* of 6 angular whorls. Suture distinct, slightly undulating, slightly constricted. One nodulose subsutural spiral cord, nodules continuation of ribs from upper whorl. Dominant sculpture of strong, broad, low axial ribs, which tend to line up on upper whorls, form 1/3 down whorl, increase markedly by midwhorl, and decrease slightly but are still strong at lower suture, 9 on penultimate whorl, 5 small ribs on face of body whorl, sixth rib on left swollen into strong varix, back of whorl lacks ribs. Axial growth lines present but very faint. Seven distinct small spiral cords near anterior tip of shell. Outer lip slightly thickened with slight, shallow stromboid notch near lower end. Sinus subsutural, very deep, at 30° angle to shell axis, margins raised, entrance constricted by strong subsutural callus. Aperture broad, subrectangular, deep. Columella narrow, nearly straight, margin callused. Anterior canal short, broad, of moderate depth. Anterior tip distinctly notched. Shell colour uniform glossy light gray.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 5.9 | 2.3 | 2.0 | 0.39 | 0.38 |
| Paratype stn CP 143 | 6.2 | 2.5 | 2.7 | 0.40 | 0.44 |

REMARKS. — *Splendrillia minima* is similar to *S. disjecta* and is of the same size, but the protoconch is more dome-shaped, and the ribs are less numerous, are angled to the left, and do not extend down the body whorl.

ETYMOLOGY. — This species is named for its small size in relation to other species of the genus.

### *Splendrillia brycei* sp. nov.

Pl. 5, Figs 1-2

TYPE MATERIAL. — Holotype MNHN. Paratypes: 11 MNHN, 3 WAM 117-94.

TYPE LOCALITY. — New Caledonia, BIOCAL, stn DW 48, 23°00′ S, 167°29′ E, 775 m.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn DW 48, 23°00′ S, 167°29′ E, 775 m, 1 dd (holotype). — Stn DW 51, 23°05′ S, 167°45′ E, 680-700 m, 2 lv, 11 dd, (paratypes: 10 MNHN, 3 WAM 117-94). — Stn DW 56, 23°35′ S, 167°12′ E, 695-705 m, 1 dd (paratype).

DISTRIBUTION. — New Caledonia in depths of from 680 to 775 m.

DESCRIPTION. — *Shell* small, up to 9 mm, high spired. *Protoconch* large, smooth, globose, of 2 whorls, 0.65 mm high, 0.95 mm wide. *Teleoconch* of 5 angular whorls. Suture distinct, slightly undulating. Dominant sculpture of strong, narrow axial ribs. Upper surface of whorl smooth, ribs begin just above midwhorl, enlarge rapidly, reach maximum at or near midwhorl, decrease but reach lower suture. Ribs do not match up on adjoining whorls; 9 on body whorl, first strong, but ribs decrease in intensity, do not extend below shoulder, last half of whorl lacks ribs, 10 ribs on penultimate whorl. Anterior tip of shell lacks spiral grooves. Shell surface smooth. Outer lip slightly incurved, slightly thickened. Sinus subsutural, very deep, U-shaped, with strong subsutural callus constricting entrance, at 30° angle to shell axis. Aperture large, broad, elongate-oval, deep. Columella nearly straight, of moderate width, smooth, margin callused. Anterior canal short, broad, shallow, anterior tip notched. Shell colour uniform glossy white.

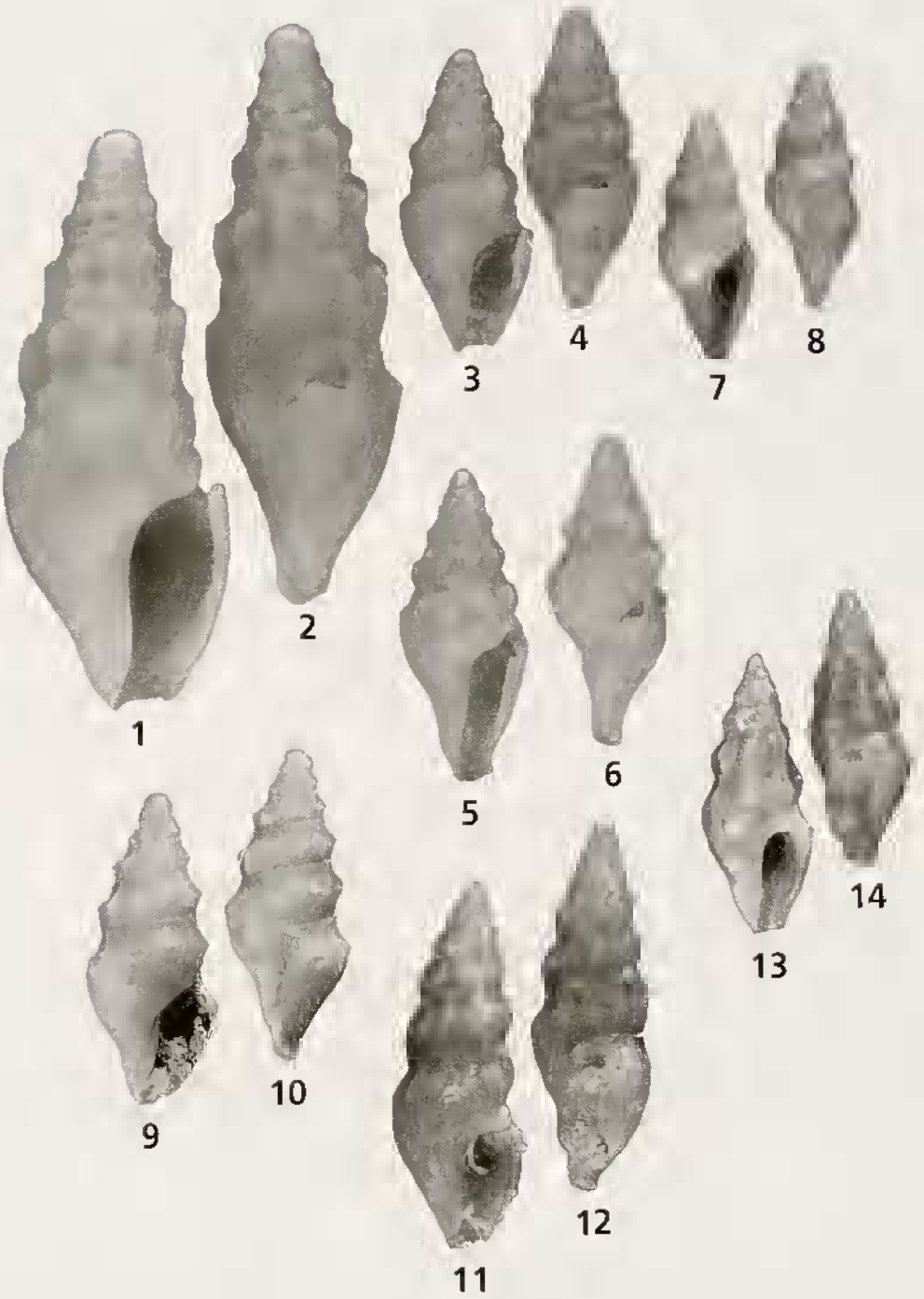


PLATE 5. — *Splendrillia*. — **1-2**, *S. brycei* sp. nov. Holotype. — **3-4**, *S. carolae* sp. nov. Holotype. — **5-6**, *S. wayae* sp. nov. Holotype. — **7-8**, *S. houbricki* sp. nov. Holotype. — **9-10**, *S. angularia* sp. nov. Holotype. — **11-12**, *S. problematica* sp. nov. Holotype. — **13-14**, *S. triconica* sp. nov. Holotype.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 7.4 | 3.2 | 3.3 | 0.43 | 0.45 |
| Paratypes stn DW 51 | 9.2 | 3.9 | 3.7 | 0.42 | 0.40 |
| | 9.1 | 4.0 | 3.8 | 0.44 | 0.42 |
| | 9.0 | 3.8 | 4.0 | 0.42 | 0.44 |

REMARKS. — Together with the next two species *Splendrillia brycei* is part of a species complex of three New Caledonian *Splendrillia* that are similar in size and shape, and are very closely related. *Splendrillia brycei* is characterized by its uniformly white colour, large size, large, globose protoconch, and the smooth base of the body whorl. *Splendrillia wayae* is smaller, has a smaller protoconch, and broad subsutural spiral cord. *Splendrillia carolae* is smaller than *S. brycei*, also has a smaller protoconch, a yellow-brown subsutural spiral cord, and spiral grooves on the base of the body whorl.

*Splendrillia brycei* is also similar to *S. houbricki* in size and shape, but is slightly larger (10 mm vs. 7 mm), with a larger protoconch (0.65 mm vs. 0.35 mm), and has broader, weaker axial ribs which do not extend completely from the upper to the lower suture.

*Splendrillia brycei* is similar to specimens in the NMW labeled as *S. raricostata* (Smith, 1879), but these do not agree with the BMNH holotype of *S. raricostata*. The NMW specimens are from Nagasaki, Japan.

ETYMOLOGY. — This species is named after Mr C.W. Bryce of the Western Australian Museum in acknowledgement of the considerable assistance he has provided to my turrid research over the last several years.

***Splendrillia carolae*** sp. nov.

Pl. 1, Fig. 7; Pl. 5, Figs 3-4

TYPE MATERIAL. — Holotype dd MNHN. Paratypes 65 MNHN, 3 WAM 23-94.

TYPE LOCALITY. — New Caledonia, BIOCAL, stn DW 46, 22°53' S, 167°17' E, 570-610 m.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn DW 44, 22°47' S, 167°14' E, 440-450 m, 34 dd (paratypes). — Stn DW 46, 22°53' S, 167°17' E, 570-610 m, 21 dd & 10 lv (1 destroyed for radula preparation) (holotype and paratypes). — Stn DW 51, 23°05' S, 167°45' E, 680-700 m, 3 dd (paratypes WAM 23-94).

DISTRIBUTION. — New Caledonia in depths of from 440 to 700 m.

DESCRIPTION. — *Shell* small, up to 8 mm, high spired. *Protoconch* large, smooth, globose, of 2 whorls, 0.35 mm high, 0.70 mm wide. *Teleoconch* of 5 angular whorls. Suture distinct, slightly undulating. Subsutural spiral cord present. Dominant sculpture of strong, narrow axial ribs. Upper surface of whorl smooth, ribs begin just above midwhorl, enlarge rapidly, reach maximum at or near midwhorl, decrease but reach lower suture. Ribs do not match up on adjoining whorls; first rib of body whorl strong but ribs decrease rapidly in strength, last half of whorl smooth, 10 ribs on penultimate whorl. Anterior lip of shell lacks fine spiral striae. Axial growth lines present but faint. Shell surface smooth. Outer lip slightly incurved, slightly thickened. Sinus subsutural, very deep, U-shaped, with strong subsutural callus constricting entrance, at 30° angle to shell axis. Aperture large, broad, elongate-oval, deep. Columella nearly straight, of moderate width, smooth, margin callused. Anterior canal short, broad, shallow, anterior tip notched. Shell colour glossy off-white with broad, faint yellowish-brown band across centre of body whorl.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 7.6 | 3.3 | 3.1 | 0.40 | 0.37 |
| Paratypes ($n=13$) | | | | | |
| Range | 7.1-7.8 | 2.8-3.5 | 2.7-3.3 | 0.34-0.49 | 0.38-0.43 |
| Mean | 7.4 | 3.2 | 3.0 | 0.43 | 0.41 |
| SD | 0.2 | 0.3 | 0.2 | 0.04 | 0.02 |

REMARKS. — *Splendrillia carolae* can be distinguished from *S. brycei* by its slightly smaller size (8 vs. 9 mm), smaller protoconch (0.35 vs. 0.95 mm high), subsutural spiral cord, and the spiral band across the centre of the body whorl. *Splendrillia carolae* can be separated from *S. wayae* by being larger (8 mm vs. 6 mm), its more globose protoconch, and the lack of spiral grooves above the base of the shell.

ETYMOLOGY. — This species is named after Dr. Carol M. LALLI, my PhD thesis supervisor, in grateful recognition of her invaluable help and encouragement both during the course of my PhD research and in the subsequent years.

***Splendrillia wayae*** sp. nov.

Pl. 5, Figs 5-6

TYPE MATERIAL. — Holotype lv MNHN. Paratypes: 128 lv and dd MNHN, 3 dd WAM 118-94.

TYPE LOCALITY. — New Caledonia, BIOCAL, stn DW 46, 22°53′ S, 167°17′ E, 570-610 m.

MATERIAL EXAMINED. — Only known from the type material.

DISTRIBUTION. — New Caledonia in depths of from 570 to 610 m.

DESCRIPTION. — *Shell* small, up to 6 mm, high spired. *Protoconch* narrow, smooth, of 2 whorls, 0.45 mm high, 0.65 mm wide. *Teleoconch* of 5 angular whorls. Suture distinct, slightly undulating. Dominant sculpture of strong, narrow axial ribs. Upper surface of whorl smooth, ribs begin just above midwhorl, enlarge rapidly, reach maximum at or near midwhorl, decrease but reach lower suture, angled strongly to the left. Ribs line up on adjoining whorls; 7 on body whorl, final rib swollen into varix, last portion of whorl smooth, 11 ribs on penultimate whorl. Anterior tip of shell with about 10 very fine spiral striae, but no other spiral sculpture. Axial growth lines present but faint. Shell surface smooth. Outer lip slightly incurved, slightly thickened. Sinus subsutural, very deep, U-shaped, with strong subsutural callus constricting entrance, at 30° angle to shell axis. Aperture large, broad, elongate-oval, deep. Columella nearly straight, of moderate width, smooth, margin callused. Anterior canal short, broad, shallow, anterior tip notched. Shell colour glossy white with yellow-brown subsutural spiral band.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 5.3 | 2.2 | 2.5 | 0.42 | 0.47 |
| Paratypes | | | | | |
| Range | 5.4-6.2 | 2.3-2.8 | 2.3-2.9 | 0.40-0.54 | 0.42-0.54 |
| Mean | 5.6 | 2.6 | 2.7 | 0.47 | 0.47 |
| SD | 0.3 | 0.2 | 0.3 | 0.05 | 0.05 |

REMARKS. — *Splendrillia wayae* is similar to *S. brycei* in size and shape, but is smaller (6 mm vs. 9 mm), with a smaller protoconch (0.45 mm vs. 0.65 mm high), the base of the body whorl has

spiral grooves, and there is a yellow-brown subsutural spiral band. *Splendrillia carolae* is also close to *S. wayae*, but lacks the spiral grooves and subsutural band.

ETYMOLOGY. — This species is named after Ms Kathie WAY of the Natural History Museum, London in acknowledgement of the considerable assistance she has provided to my turrid research over the last several years through the loan of material and providing information on specimens in the BMNH collection.

***Splendrillia houbricki*** sp. nov.

Pl. 3, Figs 1-2; Pl 5, Figs 7-8

TYPE MATERIAL. — Holotype MNHN. Paratypes: 113 MNHN, 4 WAM 20-94.

TYPE LOCALITY. — West Indian Ocean, Mozambique Channel, BENTHEDI, stn DS 120, 11°30′ S, 47°25′ E. 335-390 m.

MATERIAL EXAMINED. — **West Indian Ocean**. Mozambique Channel, BENTHEDI: stn DS 120, 11°30′ S, 47°25′ E, 335-390 m, 1 dd (holotype).
**New Caledonia**. BIOCAL: stn DW 44, 22°47′ S, 167°14′ E, 440-450 m, 27 lv, 26 dd (paratypes). — Stn DW 66, 24°55′ S, 168°22′ E, 505-515 m. 25 lv (1 destroyed for radula preparation), 34 dd (paratypes). CHALCAL 2: stn CC 2, 24°55′ S, 168°21′ E, 500 m, 1 lv (paratype).
**Loyalty Islands**. MUSORSTOM 6: stn DW 468, 21°06′ S, 167°33′ E, 600 m, 4 dd (paratypes WAM).

DISTRIBUTION. — Only known from the Mozambique Channel and New Caledonia in depths of from 335 to 600 m.

DESCRIPTION. — *Shell* small, up to 6.5 mm, high spired. *Protoconch* small, low, rounded, smooth, of 1.5 whorls, 0.65 mm wide, 0.35 mm high. *Teleoconch* of 5 convex whorls. Suture thin, distinct, slightly undulating. Whorls convex, but some slightly angular. Sculpture dominated by strong, narrow axial ribs, which begin at upper suture but remain small on shoulder, enlarge rapidly, reach maximum 1/3 down whorl, taper off but reach lower suture, and tend to line up on adjacent lower whorls; 9 on body whorl, third from last enlarged into varix, not extending past shoulder of body whorl, 9 on penultimate whorl. Faint axial growth striae present, but shell surface generally smooth. About 8 spiral striae near anterior lip of shell, but these may be very faint. Outer lip thin, faint stromboid notch near lower margin. Sinus deep, broad, U-shaped, margins slightly raised but not thickened, at 30° angle to shell axis, parietal callus small, subsutural. Aperture broad, of moderate depth, elongate-ovate. Columella narrow, smooth, nearly straight, slightly callused. Anterior canal short, broad, shallow. Shell colour uniform glossy white or transparent. Some paratypes have a thin subsutural yellow line.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 4.5 | 2.2 | 2.3 | 0.49 | 0.51 |
| Paratypes | | | | | |
| BIOCAL stn DW66 ($n=9$) | | | | | |
| Range | 4.5-6.5 | 2.2-2.4 | 2.1-2.5 | 0.36-0.47 | 0.41-0.54 |
| Mean | 5.5 | 2.3 | 2.4 | 0.41 | 0.45 |
| SD | 0.6 | 0.1 | 0.1 | 0.03 | 0.05 |

REMARKS. — *Splendrillia houbricki* is very close to *S. brycei* in size, shape and general structure. It is smaller (up to 6.5 mm vs. up to 9 mm), has a smaller protoconch (0.35 mm high vs. 0.65 mm), and has ribs that extend from suture to suture and are narrower and stronger.

*Splendrillia houbricki* can also be compared with *S. nenia* (Hedley, 1903) from New South Wales, Australia, which has the same size and shape. However, *S. nenia* can be distinguished from *S. houbricki* by its more numerous axial ribs (12 on the penultimate whorl and 10 on the body whorl), and more angular sculpture. *Splendrillia houbricki* can be separated from *S. powelli* Wells, 1990, from Queensland, Australia by being smaller (up to 7 mm vs. 9 mm), with distinctly less angular ribs which extend completely from the upper to the lower suture instead of only part of the way. *Splendrillia powelli* Wells, 1990 is a secondary homonym of *S. powelli* (King, 1934). A replacement name will be proposed for *S. powelli* Wells, 1990 (J. K. TUCKER pers. comm.).

ETYMOLOGY. — I take pleasure in naming this new species after the late Richard ("Joe") HOUBRICK.

***Splendrillia angularia*** sp. nov.

Pl. 5. Figs 9-10

TYPE MATERIAL. — Holotype and 1 paratype MNHN.

TYPE LOCALITY. — New Caledonia, MUSORSTOM 4, stn DC 168, 18°48′ S, 163°11′ E, 720 m.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4: stn DC 168, 18°48′ S, 163°11′ E, 1 dd (holotype).
BIOCAL: stn CP 61, 24°11′ S, 167°32′ E, 1070 m, 1 dd (paratype).

DISTRIBUTION. — New Caledonia in depths of from 720 to 1070 m.

DESCRIPTION. — *Shell* small, 8 mm, high spired, heavy. *Protoconch* high, rounded, of 2 whorls, smooth with microscopic pitting, 1.05 mm wide, 0.75 mm high. *Teleoconch* of 5 angular whorls. Suture distinct, thin, nearly straight, very slightly channeled. Sculpture dominated by strong axial ribs. Shoulder smooth, ribs begin about 1/3 down whorl, increase rapidly to maximum at mid-whorl, decrease but reach lower suture, and are strongly triangular in outline with sharp peak, 15 on body whorl, 11 on penultimate whorl, and do not extend far down body whorl. About 10 indistinct spiral cords near anterior tip of shell. Numerous indistinct axial growth lines on body whorl. Outer lip chipped in holotype, more broken in paratype. Sinus subsutural, deep V-shaped, margins not raised, no callus present. Aperture broad, deep, subrectantular with lower end slightly narrowed. Columella narrow, distinctly convex, margin slightly callused. Anterior canal short, very broad, shallow, anterior tip not notched. Shell colour uniform semiglossy off-white.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 8.3 | 3.6 | 3.5 | 0.43 | 0.42 |

REMARKS. — *Splendrillia angularia* is closest to *S. brycei* but is smaller (8 mm vs. 10 mm), has a larger protoconch (0.75 mm high vs. 0.65 mm), and has more angular ribs which are also more numerous (15 vs. 9 on the body whorl).

ETYMOLOGY. — *Angularia* refers to the angular appearance of the whorl outlines of this species.

### *Splendrillia problematica* sp. nov.

Pl. 5, Figs 11-12

TYPE MATERIAL. — Holotype dd MNHN.

TYPE LOCALITY. — New Caledonia, CHALCAL 2, stn DW 71, 24°42′ S, 168°10′ E, 230 m.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION. — *Shell* small, 8 mm, narrow, high spired. *Protoconch* high, conical, of 3 whorls but upper whorl broken off, smooth with microscopic pitting. *Teleoconch* of 6 convex whorls. Suture thin, distinct, undulating. Dominant sculpture of strong narrow, low axial ribs which begin at upper suture, expand to midwhorl, decrease but are still strong at lower suture, and do not line up on adjacent whorls. Ribs are narrow at base, but become much narrower near top, and are slightly curved and angled to the left; 12 on body whorl, 11 on penultimate whorl, ribs on body whorl reaching almost to anterior tip of shell. Axial growth lines present but very faint. About 15 faint spiral cords just above anterior tip of shell. Outer lip slightly thickened with distinct stromboid notch just above base. Sinus subsutural, very deep, margins raised, at 45° angle to shell axis, entrance constricted by strong subsutural parietal callus. Aperture wide, subrectangular, deep. Columella narrow, nearly straight, margin callused. Anterior canal short, broad, deep. Anterior tip slightly notched. Shell colour glossy white with light yellow subsutural line on each whorl, three on body whorl — subsutural, across middle of whorl, and on lower whorl.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 7.7 | 2.9 | 2.8 | 0.38 | 0.36 |

REMARKS. — *Splendrillia problematica* is closest to *S. triconica*, and shares with it the high conical protoconch of three whorls and small, distinct stromboid notch on the lower edge of the outer lip. Because of the three whorls of the protoconch *S. problematica* is only tentatively placed in *Splendrillia*. *Splendrillia problematica* differs from *S. triconica* in being slightly larger (8 vs. 6 mm), in having 6 vs. 5 teleoconch whorls, lacking a varix on the body whorl, and in having narrower, more numerous (11-12 vs. 7) axial ribs on the lower whorls.

ETYMOLOGY. — *Problematica* refers to the uncertainty of the generic status of this species.

### *Splendrillia triconica* sp. nov.

Pl. 1, Fig. 8; Pl. 3, Fig. 4; Pl. 5, Figs 13-14

TYPE MATERIAL. — Holotype lv MNHN. Paratypes: 25 lv and dd, MNHN, 5 dd WAM 15-94

TYPE LOCALITY. — New Caledonia, BIOCAL, stn DW 44, 22°47′ S, 167°14′ E, 440-450 m.

MATERIAL EXAMINED. — Only known from the type material.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION. — *Shell* very small, 6 mm, high spired, broad. *Protoconch* high, conical, of 3 whorls, smooth with microscopic pitting, 0.72 mm wide, 0.63 mm high. *Teleoconch* of 5 convex whorls, which increase rapidly in size so the base of each whorl is substantially broader than top. Suture distinct, undulating, slightly channeled. Spiral sculpture of several very indistinct subsutural striae. Dominant sculpture of strong, narrow axial ribs, continuous on some, but not all, adjacent whorls, 7 on penultimate whorl, 7 on body whorl, final rib on body whorl swollen into strong varix, ribs extending well down body whorl almost to tip of shell. Numerous very fine axial growth lines. About 8 very

faint spiral cords at base of shell. Outer lip slightly thickened with small, strong stromboid notch just above base. Sinus subsutural, on mid-shoulder, deep, margins strongly raised, entrance nearly sealed by strong callus. Aperture broad, elongate-oval, deep. Columella very narrow, nearly straight, margin slightly callused. Anterior canal short, very broad, of moderate depth, anterior tip slightly notched. Shell colour glossy white with yellow bands between ribs and two bands across body whorl, one subsutural and one at midwhorl.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 5.9 | 2.5 | 2.6 | 0.42 | 0.42 |
| Paratypes ($n=6$) | | | | | |
| Range | 5.2-6.2 | 2.2-2.5 | 2.2-2.7 | 0.39-0.44 | 0.41-0.49 |
| Mean | 5.6 | 2.3 | 2.4 | 0.42 | 0.44 |
| SD | 0.4 | 0.1 | 0.2 | 0.02 | 0.03 |

REMARKS. — *Splendrillia triconica* is placed provisionally in *Splendrillia* despite having a protoconch of three whorls. In this regard it is similar to *S. problematica*, but can be separated from that species by being slightly smaller (6 mm vs. 8 mm), with broader, less numerous (7 vs. 11-12) axial ribs on the lower whorls.

The heptagonal shape of *Splendrillia triconica* is similar to that of *S. boucheti*, but the former species differs in having a protoconch of 3 whorls, a much broader shape, a broader aperture, a strong varix, and in having axial ribs present on the entire body whorl.

ETYMOLOGY. — *Triconica* refers to the conical protoconch of three whorls.

### ***Splendrillia globosa*** sp. nov.

Pl. 6. Figs 1-2

TYPE MATERIAL. — Holotype MNHN. Paratypes: 4 MNHN, 2 WAM 22-94.

TYPE LOCALITY. — New Caledonia, MUSORSTOM 4, stn DW 227, 22°46′ S, 167° 20′ E, 300 m.

MATERIAL EXAMINED. — **New Caledonia**. *"Vauban"* 1978-79: stn 16, 22°46′ S, 167°12′ E, 390-400 m, 1 dd (paratype).
MUSORSTOM 4: stn DW 227, 22°46′ S, 167°20′ E, 300 m, 2 dd (holotype and paratype).
P. Tirard coll., ca. 22°40′ S to 22°50′ S, 167°10′ E to 167°30′ E, 200-350 m, 3 dd (paratypes: 1 MNHN, 2 WAM 22-94).

DISTRIBUTION. — New Caledonia in depths of 200 to 400 m.

DESCRIPTION. — *Shell* large for genus, to 17 mm, high spired. *Protoconch* low, rounded, smooth, of 2 whorls, 0.55-0.70 mm high, 0.90-0.95 mm wide. *Teleoconch* of 7 slightly rounded whorls. Suture thin, distinct, nearly straight, slightly channeled on upper whorls. Whorls generally smooth, upper 4 teleoconch whorls with 8 strong, narrow axial ribs which line up on adjacent whorls, extend from suture to suture, and are slightly larger on lower half of whorl. These ribs begin to give out on the fourth whorl, and the shell surface becomes smooth. Body whorl smooth except for a large varix on back half. Entire shell surface with very fine, microscopic spiral striae and axial growth striae. Outer lip slightly thickened with distinct stromboid notch on lower surface. Sinus subsutural, very deep, entrance slightly constricted by distinct callus, at 30° angle to shell axis. Aperture elongate, of moderate width, deep, outer margin nearly straight, inner margin somewhat semicircular. Columella smooth, narrow, slightly convex, shell truncate, anterior canal short, broad, moderate depth, anterior tip notched. Shell colour light pink or glossy white.

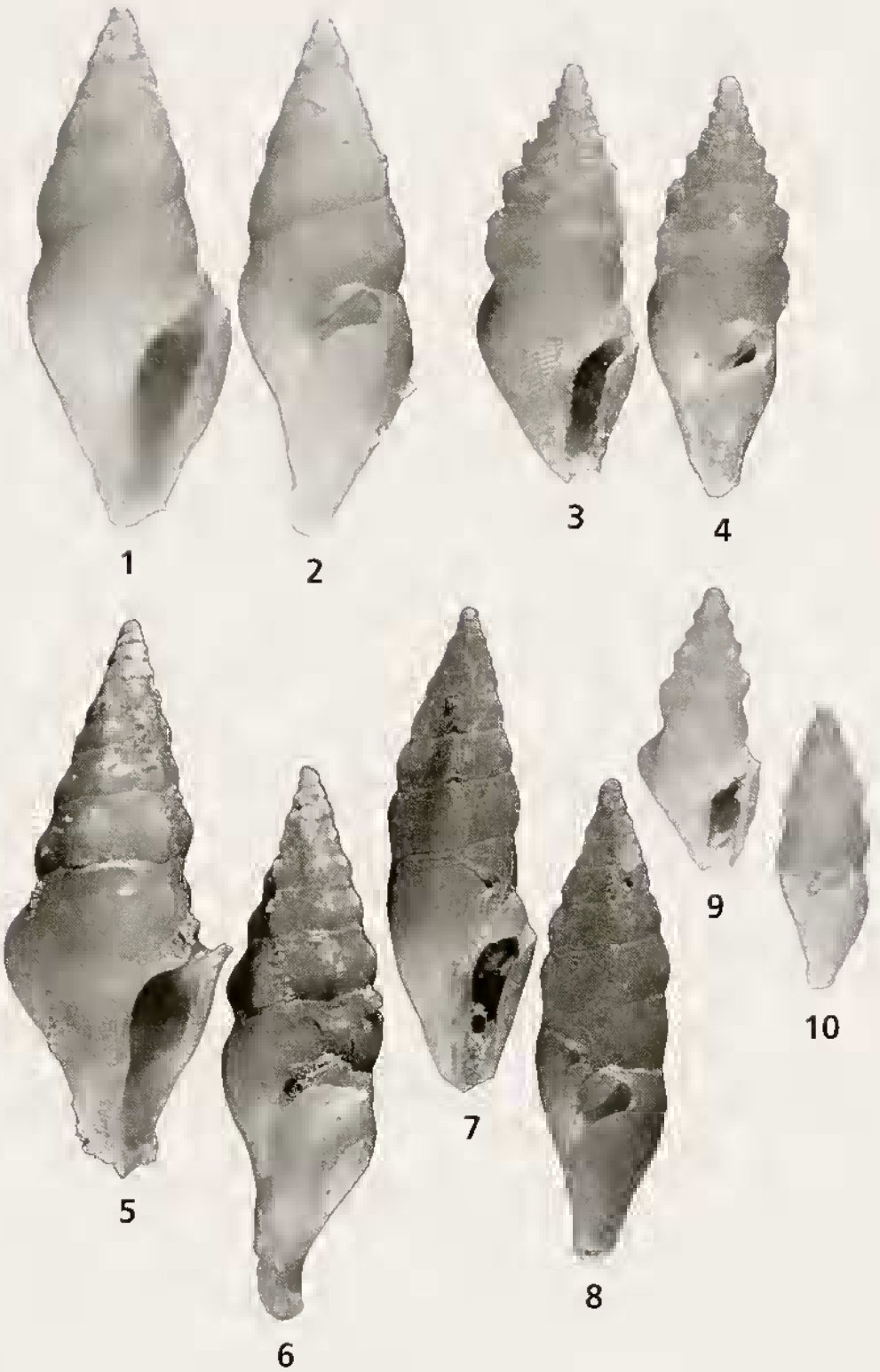


PLATE 6. — *Splendrillia* and *Plagiostropha*. — **1-2**, *S. globosa* sp. nov. Holotype. — **3-4**, *P. turrita* sp. nov. Holotype. — **5-6**, *P. hexagona* sp. nov. Holotype. — **7-8**, *P. caledoniensis* sp. nov. Holotype. — **9-10**, *P. costata* sp. nov. Holotype.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 16.3 | 6.5 | 7.2 | 0.40 | 0.44 |
| Paratype stn 16 | 11.3 | 4.3 | 4.8 | 0.38 | 0.42 |
| Paratype Tirard coll. | 16.5 | 6.2 | 6.7 | 0.38 | 0.41 |
| | 14.3 | 5.7 | 6.3 | 0.40 | 0.44 |
| Paratype stn DW 227 | 12.7 | 5.1 | 5.2 | 0.40 | 0.41 |

REMARKS. — The characteristic feature of *Splendrillia globosa* is the smooth shell surface on the later whorls, interrupted only by the strong varix on the body whorl. This smooth surface separates *Splendrillia globosa* from all of the other New Caledonian *Splendrillia*. The smooth surface is shared by *S. gratiosa* (Sowerby, 1896) from southern Australia. In addition to being from a separate geographical region, *S. gratiosa* can be separated from *S. globosa* by having a narrower shell with a higher spire.

ETYMOLOGY. — *Globosa* refers to the broad shape of this species.

## Genus *Plagiostropha* Melvill, 1927

*Plagiostropha* Melvill, 1927: 151. Type species: *Plagiostropha quintuplex* Melvill 1927, by monotypy.

Other references:

*Plagiostropha* – WELLS, 1991a: 26-29. — TAYLOR *et al.*, 1993: 163.
*Clavus* (*Plagiostropha*) – POWELL, 1966. — SHUTO, 1983: 293-295.

DIAGNOSIS. — *Shell* small, 8-20 mm, heavy, high spired, biconic. *Protoconch* paucispiral, small, of 2 whorls, smooth, globose. *Teleoconch* of up to 9 whorls. Strong axial pentagonal ribbing on most species, including the type species. Shell truncated, sinus very deep, margins elevated, on upper shoulder at 30° angle to shell axis. Outer lip strongly incurved, aperture narrow. Body whorl with pronounced low varix. Shell usually white.

Indo-Pacific; 95 to 410 m.

REMARKS. — This is a small group of claviform turrids characterized primarily by the strong pentagonal shape in transverse section. The relationship between *Plagiostropha* and *Clavus* has been uncertain. MELVILL (1927) described *Plagiostropha* as a separate genus. POWELL (1966) and SHUTO (1983) regarded *Plagiostropha* as a subgenus of *Clavus*. In a separate manner, SPRINGSTEEN & LEOBRERA (1986) placed a species of *Plagiostropha*, *P. opalus* (Reeve, 1845) in *Clavus* (*Clavus*). Most recently WELLS (1991a) and TAYLOR *et al.* (1993) recognised *Plagiostropha* as a valid genus. I believe the species of *Plagiostropha* can be separated at the generic level from *Clavus flammulatus* Montfort, 1810, the type species of *Clavus*, by their biconic shape, the strong varix on the left side of the body whorl, the lack of strong axial ribbing on the body whorl, the very deep sinus, the reflected lip, the narrow aperture, and the truncated body whorl. Almost all species of *Plagiostropha* have the characteristic pentagonal shape.

### *Plagiostropha turrita* sp. nov.

Pl. 6, Figs 3-4

TYPE MATERIAL. — Holotype MNHN. Paratypes: 5 MNHN, 1 WAM 239-94.

TYPE LOCALITY. — New Caledonia, LAGON, stn 429, 22°40′ S, 167°15′ E, 95 m.

MATERIAL EXAMINED. — **New Caledonia**. LAGON: stn 429, 22°40′ S, 167°15′ E, 95 m, 1 dd (holotype). — Stn 872, 20°37′ S, 165°58′ E, 105 m, 1 dd (paratype). — Stn 937, 20°40′ S, 164°15′ E, 50-55 m, 12 dd. — Stn 942, 20°37′ S, 164°13′ E, 15 m, 1 dd. — Stn 972, 20°25′ S, 163°58′ E, 27 m, 1 dd (paratype). — Stn 995, 20°15′ S, 163°55′ E, 35-36 m, 1 dd (paratype). — Stn 1007, 20°12′ S, 163°52′ E, 23-24 m, 1 dd (paratype). — Stn 1024, 20°06′ S, 163°50′ E, 26 m, 6 dd (1 paratype WAM). — Stn 1171, 19°17′ S, 163°23′ E, 60 m, 1 dd. — Stn 1181, 19°24′ S, 163°15′ E, 45 m, 1 dd (paratype).

DISTRIBUTION. — New Caledonia in depths of from 15 to 105 m.

DESCRIPTION. — *Shell* small, 10 mm, high spired, conical, anterior end truncate, solid. *Protoconch* small, high, smooth, of 2 whorls, 0.85 mm high, 1.00 mm wide. *Teleoconch* of 8 angular whorls. Suture narrow but distinct, strongly undulating. Seulpture dominated by 5 very strong, narrow axial ribs which give shell a pentagonal shape. Ribs begin at upper suture and reach peak rapidly where remnant of previous sinus protrudes, giving whorl strong peak about 1/3 down whorl. Ribs extend to base of whorl and line up on adjacent whorls, except body whorl where they are offset. Two small axial ribs on body whorl, followed by strong varix just behind left face of whorl, no ribs on back of whorl. Entire shell surface, except protoconch, with distinct spiral cords, 11 on penultimate whorl, about 35 on body whorl, extending to anterior tip of shell, last six very strong. Spiral cords crossed by numerous axial growth lines giving shell a beaded appearance, some growth lines on body whorl very strong. Outer lip thickened, strongly incurved with broad, shallow stromboid notch on lower surface. Sinus very deep, at 45° angle to shell axis, margin thickened, entrance nearly sealed by strong callus and incurved outer lip, almost forming a circular tube. Aperture narrow, rectangular, deep. Columella narrow, smooth, slightly convex, margin strongly callused. Anterior canal short, broad, deep, anterior tip distinctly notched. Shell colour uniform glossy white.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 10.2 | 4.1 | 4.0 | 0.41 | 0.40 |
| MNHN Paratype ($n=5$) | | | | | |
| Mean | 13.2 | 5.4 | 5.4 | 0.41 | 0.41 |

REMARKS. — The upper whorls of *Plagiostropha turrita* have a turreted appearance which separates this species from all other species of *Plagiostropha*. The species is unique among the New Caledonian *Plagiostropha* in having numerous spiral cords and a beaded appearance. In addition, it can be easily separated from *P. hexagona* by the hexagonal shape of *P. hexagona*. *P. turrita* is also smaller in size (10 mm vs. 17 mm) and has a truncated anterior end. It can be distinguished from *P. costata* by its larger size (10 mm vs. 7.5 mm), and weaker varix on the body whorl. *Plagiostropha turrita* can be separated from *P. caledoniensis* by its smaller size (10 mm vs. 15 mm), broader shape, and lower spire, and in having a distinct varix on the body whorl.

ETYMOLOGY. — *Turrita* refers to the turreted upper whorls of this species.

***Plagiostropha hexagona*** sp. nov.

Pl. 6, Figs 5-6

TYPE MATERIAL. — Holotype dd MNHN.

TYPE LOCALITY. — New Caledonia, SMIB 2, stn DW 23, 22°31′ S, 167°37′ E, 410-420 m.

MATERIAL EXAMINED. — Only known from the type material.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION. — *Shell* large for genus, 17 mm, biconic, very high spired, with a very long anterior canal. *Protoconch* low, presumably smooth but surface eroded after death, tip broken off, remaining protoconch of one whorl, 0.65 mm high, 0.35 mm wide. *Teleoconch* of 9 convex whorls, widest near the bottom of whorl. Suture adpressed, distinct, nearly straight. Dominant sculpture of strong, narrow, rounded axial ribs, 6 per whorl, giving shell a hexagonal shape. Subsutural area smooth, ribs begin about 1/3 down whorl, enlarge rapidly below the midpoint of the whorl, decrease, but reach lower suture. Ribs line up on lower whorls, but not on upper three whorls. Some very faint axial striae on upper surface of upper whorls, but in general whorl surface is smooth. Final axial rib on body whorl large, giving left face of body whorl a swollen appearance. Surface of body whorl smooth except for 4 faint axial ribs. Faint axial growth striae present. Outer lip thickened but heavily chipped. Sinus on outer shoulder large, very deep, entrance constricted by strong subsutural callus, margin of sinus thickened, strongly raised. Aperture narrow, elongate ovate, deep. Columella narrow, smooth, central area with bump, margin deeply callused. Anterior canal long, narrow, deep, anterior end curved to right. Shell colour uniform glossy white.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 17.4 | 6.8 | 7.7 | 0.39 | 0.44 |

REMARKS. — *Plagiostropha hexagona* is narrower and more elongate than all other *Plagiostropha*. It is distinctive among the New Caledonian *Plagiostropha* in having a hexagonal shape based on six strong axial ribs instead of the five usually found in the genus. It is also unusual in being narrow for the genus with a long, curving anterior canal.

ETYMOLOGY. — *Hexagona* refers to the six strong axial ribs which characterize this species.

***Plagiostropha caledoniensis*** sp. nov.

Pl. 6, Figs 7-8

TYPE MATERIAL. — Holotype MNHN.

TYPE LOCALITY. — New Caledonia, P. Tirard coll., ca 22°40′ S to 22°50′ S, 167°10′ E to 167° 30′ E, 200-350 m.

MATERIAL EXAMINED. — Only known from the type locality.

DISTRIBUTION. — Only known from the type material.

DESCRIPTION. — *Shell* of medium size for genus, 15 mm, very high spired, narrow. *Protoconch* small, of 1.5 whorls, low rounded, dome shaped, surface smooth except for microscopic pitting, 0.39 mm high, 0.69 mm wide. *Teleoconch* of 9 convex whorls. Suture distinct, slightly undulating. Sculpture dominated by 5 strong narrow, ribs per whorl, giving shell a pentagonal shape. Ribs begin at upper suture, increase gradually until midwhorl, decrease but reach lower suture. Penultimate whorl high. Ribs become faint on penultimate whorl, slight rib on left face of body whorl giving left side a slightly swollen appearance. Except for this rib, surface of body whorl smooth with faint axial growth striations and spiral striae. Striae are faint, except for 15 slightly stronger striae near anterior tip of shell. Outer lip thickened, slightly incurved, with distinct notch on lower surface. Sinus on mid-shoulder, deep, entrance constricted by deep subsutural callus, at 45° angle to shell axis, margins thickened and slightly raised. Aperture subrectangular, narrow, deep. Columella of moderate width, slightly convex, smooth, margin callused with a strong notch outside anterior tip. Anterior canal short, broad, deep, anterior tip notched. Shell colour uniform light brown.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 14.6 | 4.7 | 5.0 | 0.32 | 0.34 |

REMARKS. — The distinguishing features of *Plagiostropha caledoniensis* are the very high spire (higher than any other species of the genus), the narrow shape, and the absence of ribs on the penultimate whorl.

ETYMOLOGY. — *Caledoniensis* refers to the fact that this species is described from New Caledonia.

***Plagiostropha costata*** sp. nov.

Pl. 6, Figs 9-10

TYPE MATERIAL. — Holotype MNHN. Paratypes: 57 lv and dd MNHN, 5 dd WAM 14-94.

TYPE LOCALITY. — West Indian Ocean, MD32 Réunion, stn DC 56, 21°05′ S, 55°12′ E, 170-225 m.

MATERIAL EXAMINED. — Only known from the type material.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION. — *Shell* small, 8 mm, high spired, truncate, broad. *Protoconch* small, globose, of 2 whorls, surface smooth with very fine microscopic pitting, 0.45-0.55 mm high, 0.70-75 mm wide. *Teleoconch* of 6 angular whorls. Suture thin, slightly undulating, distinct. Dominant sculpture of 5 strong, narrow ribs, giving shell a pentagonal shape. Ribs begin just below upper suture, enlarge rapidly, reach maximum above midwhorl, then decrease but reach lower suture. Ribs tend to angle to the right, and do not always line up on adjacent whorls. Ribs on body whorl not as strong except for rib on left face of body whorl, which is massive, giving a very strong swollen appearance to left side of body whorl. About 5 strong spiral striae at anterior tip of shell. Shell surface smooth except for faint axial growth striae and very fine microscopic pitting. Outer lip strongly thickened, strongly incurved with distinct stromboid notch on lower surface. Sinus very deep, end rounded, entrance constricted by distinct, but not strong callus. Aperture of moderate width, subrectangular, deep. Columella narrow, nearly straight, smooth, slightly callused. Anterior canal short, broad, of moderate depth, slightly notched. Shell colour uniform glossy white.

Measurements (mm):

| | Length | Width | Aperture | W/L | A/L |
|---|---|---|---|---|---|
| Holotype | 7.8 | 3.0 | 3.3 | 0.38 | 0.42 |
| Paratypes ($n=15$) | | | | | |
| Mean | 7.4 | 3.2 | 3.0 | 0.44 | 0.44 |
| SD | 0.2 | 0.3 | 0.2 | 0.04 | 0.04 |

REMARKS. — *Plagiostropha costata* is characterized by its small size, in having the left side of the face of the body whorl extremely swollen, and the fact that the axial ribs do not always match on adjacent whorls.

ETYMOLOGY. — *Costata* refers to the strong axial rib on the left side of the body whorl of this species.

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